

light of later work. Students who wish to learn something of the nature of metallography without studying one of the larger works will find a simple account of the subject in the second and third chapters, illustrated by excellent photomicrographs from standard works, but references to original sources are throughout irregular and imperfect.

(2) The well-known treatise on electric steel furnaces by Rodenhauser and Schoenawa has now reached a third edition and has been completely revised by the authors and the translator. During the stress of the war period there was a remarkable increase in the number of electric furnaces employed in the steel industry, but the results obtained have been varied. Opinions strongly in favour of—and others as strongly unfavourable towards—the electric furnace are held by different technical experts. The reason for this diversity appears to be that in many cases the furnace has been improperly handled. A steel smelter who is ignorant of electrical engineering, or an electrical engineer who has little or no acquaintance with the metallurgy of steel, is unlikely to obtain success with this method of manufacture. Where the right combination of engineering with metallurgical knowledge and experience is found, the electric furnace gives most favourable results. The perfect control over the melting conditions which it allows is greatly in its favour, especially when steels containing costly alloy metals are concerned, and its position in the steel industry is assured. This is true even of countries where fuel is abundant, but the advantages are still greater in those countries where water power is available and fuel scarce. This gives importance to the electric blast-furnace, an appliance which can scarcely compete with the highly efficient blast-furnace on its own ground, but which may prove the salvation of iron-ore producing countries which have no coal.

The present work is written mainly from the electrical point of view, and is very full in its treatment of the electrical conditions of construction and working. The metallurgical working is comparatively lightly touched on; in fact, the chemistry of electric steel making still awaits textbook treatment. As might be expected from the associations of the authors, the induction furnace is given greater prominence than is usual in other works on the subject, and the discussion of this type is very full. The Röchling-Rodenhauser furnace is now in use in 20-ton sizes, a remarkably large capacity for this class, while it is maintained that induction furnaces may be used successfully for the refining of steel, although the

question of the relatively cold slag is not fully dealt with. The work refers mainly to German and American practice, and the types of furnace most largely employed in this country are rather briefly discussed. The consideration of the electrical conditions and of the thermal balance is very thorough, and many records of actual runs are included. English readers will also be glad to have the detailed account of iron-ore smelting in Sweden and elsewhere, illustrated by clear diagrams and numerical records. An interesting account of experiments on the reduction of ore (a fine magnetite high in sulphur) by means of sulphurous coke breeze in the Röchling-Rodenhauser furnace is given, liquid metal from a basic Bessemer converter being used to start the charge. A good efficiency was obtained and about half the sulphur was eliminated without the use of lime. Minor criticisms are, of course, possible, but metallurgists who are considering the advantages of this method of manufacture will find the book indispensable.

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Our Bookshelf.

The Year-Book of the Scientific and Learned Societies of Great Britain and Ireland. Compiled from official sources. Thirty-eighth annual issue. Pp. viii+366. (London: C. Griffin and Co., Ltd., 1921.) 15s. net.

WE are glad to extend a welcome to the new issue of this invaluable year-book. The system adopted in previous issues of classifying the societies according to the subjects with which they are concerned is adhered to, and a few pages are devoted to miscellaneous societies particulars of which were received too late for classification.

We notice that, of the twenty-six Research Associations referred to in *NATURE* of December 15, p. 489, which have been approved by the Department of Scientific and Industrial Research, one only—and that, one of those more recently constituted—namely, the British Cast Iron Research Association, appears to have been included. We have also been unable to find any mention of the Association of Economic Biologists. In spite of these omissions the year-book is an indispensable adjunct to every library, society, and similar institution the members of which require accurate official particulars of the learned societies of the British Isles. The publishers perform a national service by providing this annual conspectus of scientific organisations and their work.

Le Mouvement Biologique en Europe. By Georges Bohn. Pp. 144. (Paris: Armand Colin, 1921.) 4 francs.

DURING the summer and autumn of 1913 the author of this pamphlet visited the most active

centres of biological research in Austria-Hungary, Russia, and Germany; he now sets forth, not only an epitome of the work that was then in progress at the several laboratories, but also his meditations on the effects produced by political circumstances upon the scientific spirit and scientific output of the respective nations. The general tenor of his views, which are deserving of most careful attention, may be gathered from the following quotations: "Les Allemands avaient voulu organiser une université grandiose à Strasbourg, mais, malgré des installations somptueuses et des crédits considérables, la vie scientifique était loin d'y avoir les mêmes manifestations brillantes qu'à Cracovie, où la domination autrichienne était moins pesante et où l'âme nationale pouvait encore s'extérioriser." "Les régimes politiques basés sur la liberté se sont toujours montrés favorables au développement des sciences et des arts. Si la discipline renforce l'esprit de logique, elle tue au contraire l'esprit d'invention." The book should be studied and digested by politicians as well as by men of science, and especially by those who are concerned with the organisation of education.

Practical Geometry for Builders and Architects.

By J. E. Paynter. (*The Directly-useful Technical Series.*) Pp. xii + 409. (London: Chapman and Hall, Ltd., 1921.) 15s. net.

IN compiling this book it has been assumed that the student is a practical man with some knowledge of the principles of geometry; hence a good deal of the more elementary work has been omitted. Among other subjects treated in the early part of the volume there are many references to surveying and surveying problems. It is almost a cause for regret that much of this matter was not also omitted, for many of the methods described would never be employed by any competent surveyor, and some could not possibly be carried out except on a sheet of drawing-paper. The author, on the other hand, is quite at home in describing the applications of geometry to problems in building construction, such as the timber of roofs, mouldings, etc., and this section of the subject, which, indeed, occupies the greater part of the volume, is excellent, and is treated in a clear, straightforward manner, which cannot fail to make the principles clear to the student.

The Electro-Deposition of Copper and its Industrial Applications. By C. W. Denny. (Pitman's Technical Primers.) Pp. xii + 108. (London: Sir Isaac Pitman and Sons, Ltd., 1921.) 2s. 6d. net.

IN this little manual an outline is given of modern practice in the electro-deposition of copper in its industrial applications. These include, besides the older process of electrotyping, manufacture of copper tubes, etc., a new method of making what is called reinforced copper, in which is embedded a grid or perforated plate of steel, complete automobile radiators, driving bands for projectiles, matrices for gramophone records, and

several other interesting processes of recent development. Considering the limitations of space, a remarkable amount of practical detail is included.

Tidal Power. By A. M. A. Struben. (Pitman's Technical Primers.) Pp. xii + 115. (London: Sir Isaac Pitman and Sons, Ltd., 1921.) 2s. 6d. net.

THE idea of the development of power by utilising the tides is not new, but interest in the subject has been stimulated recently by the enunciation of the Severn scheme. The non-technical reader will find a number of modern proposals discussed in this book, together with estimates of costs, working expenses, and the probable power which may be obtained. Owing to the lack of practical experience on the large scale, a good deal of the matter presented is speculative; indeed, as the author himself states, there is ample scope for the display of originality, as this field is practically untrodden. He is right in advocating research, and we trust that there will be adequate research work done prior to the undertaking of any gigantic schemes.

Mining Physics and Chemistry. By J. W. Whitaker. With an introduction by Prof. W. H. McMillan. Pp. xii + 268. (London: Edward Arnold and Co., 1921.) 9s. net.

MR. WHITAKER'S book is an introductory account of the physics and chemistry affecting mining students. The standard is not high, but so far as it goes the account is clear and accurate. Special attention is directed to such matters as flame and oxidation, mine gases (including carbon monoxide and its physiological effects), surface and mine waters, coal, and explosives. Methods of analysis are also given. The title of Fig. 25 is incorrect.

Organic Analysis, Qualitative and Quantitative. By E. De Barry Barnett and P. C. L. Thorne. Pp. xi + 168. (London: University of London Press, Ltd., 1921.) 7s. 6d.

THE methods used in the detection of common organic substances, and some typical quantitative estimations, are described. Methods of determining molecular weights, and polarimetry, which are adequately dealt with in books on practical physical chemistry, might have been omitted. The authors have produced a very useful compendium for students of chemistry.

Calculations in Organic Chemistry. By Prof. V. K. Bhagwat. Pp. xi + 138. (Bombay: S. Govind and Co., 1921.)

THE calculations and examples collected by Prof. Bhagwat should be very useful to teachers and students, as they are of the type which regularly appear in degree examination papers. The publishers have scarcely done full justice to the author in the get-up of the book. An English edition would probably be found useful.